



SELECTION GUIDE

Hermetic High Reliability Optocoupler Products



broadcom.com

Hermetic High Reliability Optocouplers

Description

Isolating one portion of an electrical circuit from another is the primary function of an optocoupler. These devices isolate different voltage levels between the input and output source. Broadcom® optocouplers are ideally suited for isolating highly sensitive portions of a circuit from the effects of transmitted common mode signals; offering a variety of input and output characteristics that enable their use in high speed, high performance applications. Broadcom hermetic optocouplers excel in designs for harsh environments that require an exceptionally strong, rugged enclosure.

For design ease, we offer most functions in 8- and 16-Pin DIPs, 20 terminal LCCCs and 16-Pin Flat Packs with various lead configurations for thru-hole or surface mount, with either single, dual or quad channels. These products are capable of operation and storage over the full military temperature range of -55°C to +125°C and can be purchased as either commercial product or with full MIL-PRF-38534 Class Level E, H or K. In line with regulations and our customers needs, we do not offer unleaded solder on our solder dipped devices. All devices are manufactured and tested on a MIL-PRF-38534 certified line and are included in the DLA (Defense Logistics Agency) Qualified Products Database Supplemental Information Sheets QPDSIS-38534 as Hybrid Microcircuits.

Broadcom has supplied high reliability hermetic optocoupler products since 1975 for use in state-of-the-art applications. To meet the

requirements of high reliability, products must be designed with rugged capabilities. They must be able to withstand severe levels of environmental stress and exposure without failure over extended periods of time. We have accomplished this objective in designing optocouplers that have proven their merits in numerous advanced space and defense programs in the international marketplace. Broadcom continuity and support of the industry has remained stable. We are committed to continued process and performance upgrades, backed up with diligent notification to our customers of major changes made using the GIDEP system.

Statistical Process Control and extensive reliability monitoring (life testing of hundreds of thousands of hours) are standard processes for hermetic optocouplers. Control charts are utilized at each critical step of the process and reviewed by product engineering to assure expected quality and reliability.

Broadcom is a champion of DLA's QPDSIS and SMD (Standard Microcircuit Drawing) programs. We support standardization, which results in cost-effectiveness and a streamlined acquisition process. As such Broadcom offers Class E, H and K products under SMD numbers. Products are dual marked with the DLA SMD and Broadcom part numbers.

Our Screening and Quality Conformance Inspection is outlined on the following page.

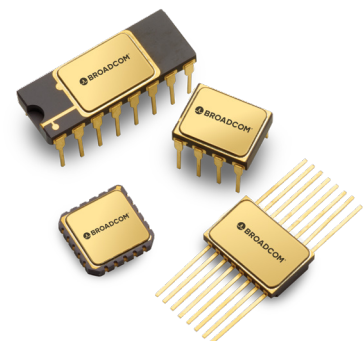
Benefits

- Long term commitment
- Recognized for high quality, reliability, and customer support
- Certified and qualified to Classes E, H and K of MIL-PRF-38534
- -55°C to +125°C operating temperature range
- Products available on DLA SMDs
- General purpose and application specific products available

Applications

Military, aerospace and harsh industrial applications such as:

- Switching power supplies/UPS
- Motor control
- Field bus
- Inverters
- Power distribution
- Communications



Screening per MIL-PRF-38534

Procedure	Method	Conditions	Class H	Class K & E
Nondestruct BondPull (Class K only, not Class E)	2023		N/A	100%
Internal Visual	2017		100%	100%
Temperature Cycle	1010	Condition C, -65°C to +150°C, 10 cycles	100%	100%
Constant Acceleration	2001	5Kgs, Y1 and Y2	100%	100%
Visual Inspection		Internal requirements	100%	100%
PIND*	2020	Condition A	N/A	N/A*
Serialization			N/A	100%
Pre-Burn-In Elec. Test		Group A, subgroup 1 (except IJ-O) (DC @ +25°C)	100%	100%
Burn-In	1015	Condition B, +125°C, 160 hours Condition B, +125°C, 320 hours	100%	100%
Interim Elec. Test		Group A, subgroup 1 (except IJ-O) (DC @ +25°C)	N/A	100%
Post Burn-In Elec. Test		Group A, subgroup 1, (DC @ +25°C), 10% PDA Group A, subgroup 1, (DC @ +25°C), 2% PDA	100%	100%
Final Elec. Test		Group A, subgroup 2 (DC @ +125°C) Group A, subgroup 3 (DC @ -55°C) Group A, subgroup 9 (AC @ +25°C) Group A, subgroup 10 (AC @ +125°C) Group A, subgroup 11 (AC @ -55°C)	100% 100% 100% 100% 100%	100% 100% 100% 100% 100%
Fine Leak	1014	Condition B1	100%	100%
Gross Leak	1014	Condition B2	100%	100%
Radiographics	2012		N/A	100%
External Visual	2009		100%	100%

Note: PIND and IGA (Internal Gas Analysis) testing (Group C) is no longer required on Broadcom optocouplers due to the construction of the devices. DLA approved this test elimination in 2002 and renewed these Optimizations in October 2020.

Quality Conformance Inspection

Group A Testing

Group A testing is satisfied per the in-line verification testing requirements of MIL-PRF-38534 for Class H devices utilizing Option 1.

Group A testing is performed per in-line sample testing requirements of MIL-PRF-38534 for Class E and K devices utilizing Option 2.

Group B Testing

Group B testing is satisfied by performing in-line process monitors as required by MIL-PRF-38534 for Class H devices utilizing Option 1.

Group B testing is satisfied by performing end of line sampling as required by MIL-PRF-38534 for Class E and K devices utilizing Option 2.

Group C Testing

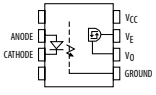
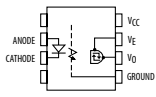
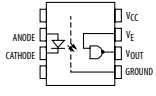
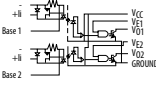
Group C testing is performed on first inspection lots and as required to evaluate or qualify changes per the requirements of MIL-PRF-38534.

Group D Testing

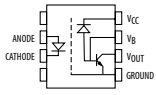
Group D testing is not performed. Note that Group D requirements are satisfied during incoming inspection element evaluation.

Please be advised that Class E, H and K devices have very similar Screening and Quality Conformance Inspection requirements as shown above. Class E and K devices, however, have substantially more stringent element evaluation and assembly criteria. The quality and reliability of these devices must be built in, not tested out.

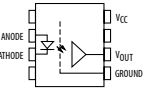
Hermetically Sealed High Speed Logic Gate Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DLA SMD Class H *	Class K	DLA SMD Class K *	Package				No. of Channels	Typical Data Rate	Common Mode @ VCM=50V	Input Current	Withstand Test Voltage	Supply Voltage Range
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC						
	HCPL-5200	HCPL-5201	5962-8876801	HCPL-520K	5962-8876802K	•				1	5MBd	1000V/μs	2-8 mA	1500 Vdc	20V
	HCPL-5230	HCPL-5231	5962-8876901	HCPL-523K	5962-8876904K	•				2	5MBd	1000V/μs	2-8 mA	1500 Vdc	20V
	HCPL-6230	HCPL-6231	5962-8876902	HCPL-623K	5962-8876905K				•	2	5MBd	1000V/μs	2-8 mA	1500 Vdc	20V
	HCPL-6250	HCPL-6251	5962-8876903	HCPL-625K	5962-8876906K			•		4	5MBd	1000V/μs	2-8 mA	1500 Vdc	20V
	HCPL-5400	HCPL-5401	5962-8957001	HCPL-540K	5962-8957002K	•				1	20MBd	500V/μs	6-10 mA	1500 Vdc	5.25V
	HCPL-5430	HCPL-5431	5962-8957101	HCPL-543K	5962-8957103K	•				2	20MBd	500V/μs	6-10 mA	1500 Vdc	5.25V
	HCPL-6430	HCPL-6431	5962-8957102	HCPL-643K	5962-8957104K				•	2	20MBd	500V/μs	6-10 mA	1500 Vdc	5.25V
	6N134	6N134/883B	8102801	HCPL-268K	5962-9800101K		•			2	10MBd	1000V/μs	10-20 mA	1500 Vdc	5.5V
	HCPL-5600	HCPL-5601	5962-9085501H	HCPL-560K	5962-9085501K	•				1	10MBd	1000V/μs	10-20 mA	1500 Vdc	5.5V
	HCPL-5630	HCPL-5631	8102802	HCPL-563K	5962-9800102K	•				2	10MBd	1000V/μs	10-20 mA	1500 Vdc	5.5V
	HCPL-5650	HCPL-5651	8102805			•				2	10MBd	1000V/μs	10-20 mA	2500 Vdc	5.5V
	HCPL-6630	HCPL-6631	8102803	HCPL-663K	5962-9800103K				•	2	10MBd	1000V/μs	10-20 mA	1500 Vdc	5.5V
	HCPL-6650	HCPL-6651	8102804	HCPL-665K	5962-9800104K			•		4	10MBd	1000V/μs	10-20 mA	1500 Vdc	5.5V
	HCPL-6650L	ACPL-6651L						•		4	10MBd	1000V/μs	10-20 mA	1500 Vdc	3.3V
	ACPL-2670L	ACPL-2672L	5962-0824203H	ACPL-268KL	5962-0824203K		•			2	10MBd	1000V/μs	10-20 mA	1500 Vdc	3.3V
	ACPL-5600L	ACPL-5601L	5962-0824201H	ACPL-560KL	5962-0824201K	•				1	10MBd	1000V/μs	10-20 mA	1500 Vdc	3.3V
	ACPL-5630L	ACPL-5631L	5962-0824202H	ACPL-563KL	5962-0824202K	•				2	10MBd	1000V/μs	10-20 mA	1500 Vdc	3.3V
	HCPL-1930	HCPL-1931	5962-8957201	HCPL-193K	5962-8957202K		•			2	10MBd	1000V/μs	12.5-60 mA	1500 Vdc	5.5V

Hermetically Sealed High Speed Transistor Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DLA SMD Class H *	Class K	DLA SMD Class K *	Package				No. of Channels	Typical Data Rate	Current Transfer Ratio	Input Current	Withstand Test Voltage	Supply Voltage Range
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC						
	4N55	4N55/883B	5962-8767901	HCPL-257K	5962-8767905K		•			2	700 KBd	9% min	12-20 mA	1500 Vdc	18V
	HCPL-5500	HCPL-5501	5962-9085401H	HCPL-550K	5962-9085401K	•				1	700 KBd	9% min	12-20 mA	1500 Vdc	18V
	HCPL-5530	HCPL-5531	5962-8767902	HCPL-553K	5962-8767906K	•				2	700 KBd	9% min	12-20 mA	1500 Vdc	18V
	HCPL-6530	HCPL-6531	5962-8767903	HCPL-653K	5962-8767907K				•	2	700 KBd	9% min	12-20 mA	1500 Vdc	18V
	HCPL-6550	HCPL-6551	5962-8767904	HCPL-655K	5962-8767908K			•		4	700 KBd	9% min	12-20 mA	1500 Vdc	18V

Hermetically Sealed High Gain Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DLA SMD Class H *	Class K	DLA SMD Class K *	Package				No. of Channels	Typical Data Rate	Current Transfer Ratio	Input Current	Withstand Test Voltage	Supply Voltage Range
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC						
	6N140A	6N140A/883B	8302401	HCPL-177K	5962-8981002K		•			4	100 KBd	300% min	0.5-5 mA	1500 Vdc	18V
	HCPL-5700	HCPL-5701	5962-8981001	HCPL-570K	5962-8981002K	•				1	100 KBd	300% min	0.5-5 mA	1500 Vdc	18V
	HCPL-5730	HCPL-5731	5962-8302401F	HCPL-573K	5962-8978503K	•				2	100 KBd	300% min	0.5-5 mA	1500 Vdc	18V
	HCPL-6730	HCPL-6731	5962-8302401F	HCPL-673K	5962-8978504K				•	2	100 KBd	300% min	0.5-5 mA	1500 Vdc	18V
	HCPL-6750	HCPL-6751	8302401F	HCPL-675K	5962-8302401F			•		4	100 KBd	300% min	0.5-5 mA	1500 Vdc	18V
	ACPL-6750L	ACPL-6751L						•		4	100 KBd	300% min	0.5-5 mA	1500 Vdc	3.3V
	ACPL-1770L	ACPL-1772L	5962-0822703H	ACPL-177KL	5962-0822703K		•			4	100 KBd	300% min	0.5-5 mA	1500 Vdc	3.3V
	ACPL-5700L	ACPL-5701L	5962-0822701H	ACPL-570KL	5962-822701K	•				1	100 KBd	300% min	0.5-5 mA	1500 Vdc	3.3V
	ACPL-5730L	ACPL-5731L	5962-0822702H	ACPL-573KL	5962-822702K	•				2	100 KBd	300% min	0.5-5 mA	1500 Vdc	3.3V

Note: *DLA SMD number does not include extensions for lead form and finish.

Hermetically Sealed AC/DC to Logic Interface Optocouplers

Hermetically Sealed Power MOSFET

Hermetically Sealed Analog Isolation Amplifier

Hermetically Sealed Intelligent Power Module and Gate Drive Interface

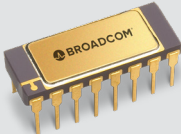
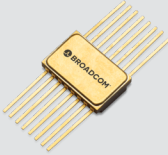
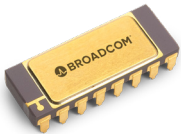
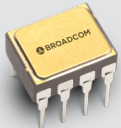
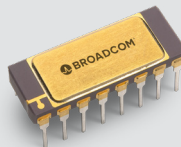
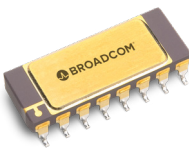
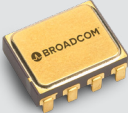
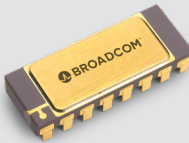
Hermetically Sealed Gate Drive Optocoupler

Pin	Signal
1	VIN+
2	VIN-
3	VCC1
4	GND1
5	RESET
6	FAULT
7	VLED1+
8	VLED1-
9	VEE
10	VEE
11	VOUT
12	VC
13	VCC2
14	DESAT
15	VDD2
16	VDD

2.0 A Highly Integrated Gate Drive Optocoupler with over-current Protection and Fault Feedback
CMOS compatible
Under Voltage Lock-Out Protection (UVLO) with Hysteresis

Note: *DLA SMD number does not include extensions for lead form and finish.

Hermetically Sealed Optocouplers

Hermetic Optocoupler Packages				
Options	8-Pin DIP	16-Pin DIP	20 Pad LCCC	16-Pin Flat Pack
				
100				
200				
300				
600				

Hermetic Options (available on 8 and 16 pin DIP packages)

100 = Butt Cut Leads (cut to just below seating plane)

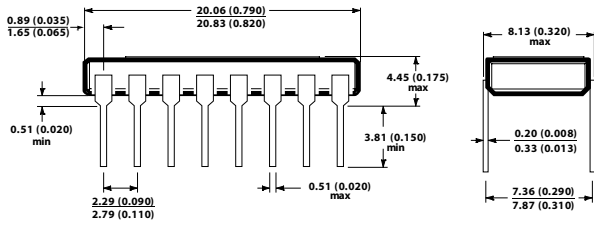
200 = Solder Dipped Leads (solder contains lead)

300 = Gull Wing Lead form (solder dipped leads only)

600 = Crew Cut Leads (cut at the seating plane)

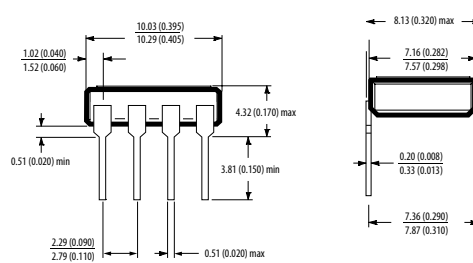
Hermetic Optocoupler Package Dimensions

16 pin DIP Through Hole (2 or 4 Channel)



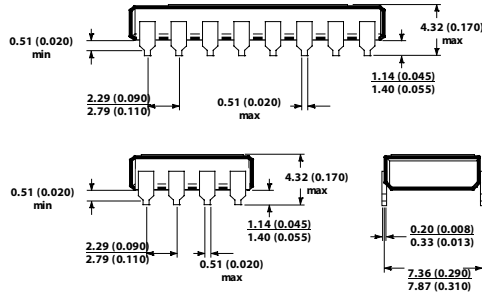
Note: Dimensions in millimeters (inches)

8 pin DIP Through Hole (1 or 2 Channel)



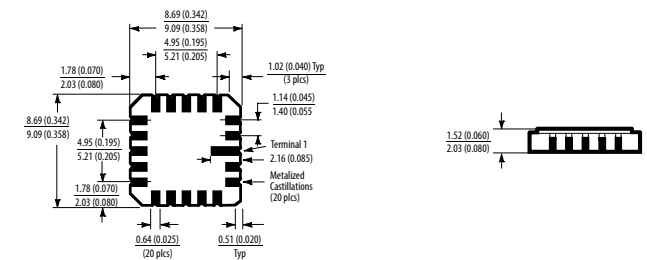
Note: Dimensions in millimeters (inches).

Option 100, Surface Mount Butt Joint, available on 8 and 16 pin DIPs



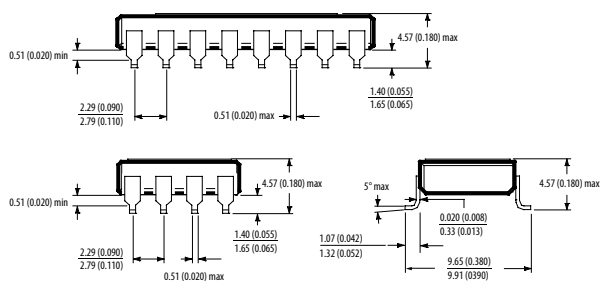
Note: Dimensions in millimeters (inches)

20 Terminal LCCC Surface Mount (2 Channel)



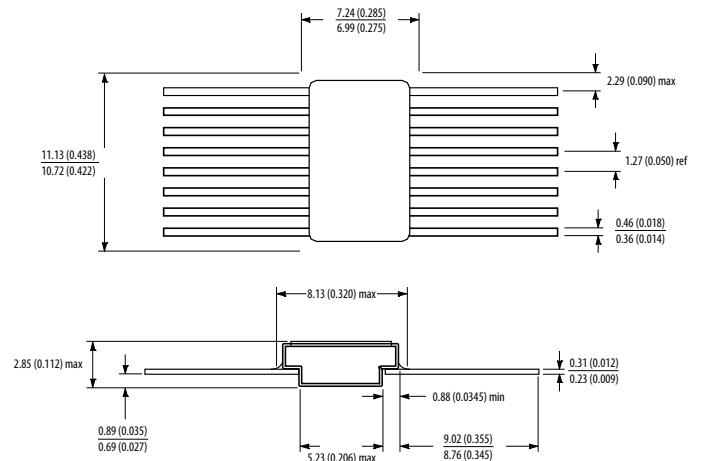
Note: Dimensions in millimeters (inches).
Solder thickness 0.127 (0.005) max.

Option 300, Surface Mount Gull Wing, available on 8 and 16 pin DIPs



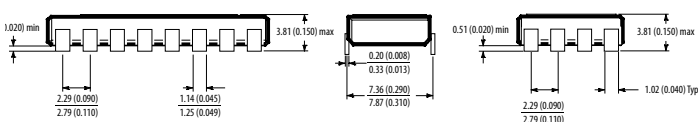
Note: Dimensions in millimeters (inches).

16 pin Flat Pack (4 Channel)



Note: Dimensions in millimeters (inches).

Option 600, Surface Mount Short Butt Joint, available on 8 and 16 pin DIPs



Note: Dimensions in millimeters (inches).

Hermetic High Reliability Optocouplers Matrix

Package Style	16 Pin DIP		8 Pin DIP		16 Pin FP	20 Terminal LCCC
# of Channels	Quad (4)	Dual (2)	Dual (2)	Single (1)	Quad (4)	Dual (2)
Darlington Output, Low Input Current, 100 kBd	6N140A 6N140A/883B 8302401 HCPL-177K 5962-9800201K		HCPL-5730 HCPL-5731 5962-8978501 HCPL-573K 5962-8978503K	HCPL-5700 HCPL-5701 5962-8981001 HCPL-570K 5962-8981002K	HCPL-6750 HCPL-6751 8302401 HCPL-675K 5962-9800201K	HCPL-6730 HCPL-6731 5962-8978502 HCPL-673K 5962-8978504K
Darlington Output, Low Input Current, 100 kBd 3.3V	ACPL-1770L ACPL-1772L 5962-0822703H ACPL-177KL 5962-0822703K		ACPL-5730L ACPL-5731L 5962-0822702H ACPL-573KL 5962-0822702K	ACPL-5700L ACPL-5701L 5962-0822701H ACPL-570KL 5962-0822701K	ACPL-6750L ACPL-6751L SMD pending ACPL-675KL SMD pending	
Transistor Output, High CMR, 700 kBd		4N55 4N55/883B 5962-8767901 HCPL-257K 5962-8767905K	HCPL-5530 HCPL-5531 5962-8767902 HCPL-553K 5962-8767906K	HCPL-5500 HCPL-5501 5962-9085401H HCPL-550K 5962-9085401K	HCPL-6550 HCPL-6551 5962-8767904 HCPL-655K 5962-8767908K	HCPL-6530 HCPL-6531 5962-8767903 HCPL-653K 5962-8767907K
High Speed Logic Output, 10 Mbaud		6N134 6N134/883B 8102801 HCPL-268K 5962-9800101K	HCPL-5630* HCPL-5631* 8102802* HCPL-563K 5962-9800102K	HCPL-5600 HCPL-5601 5962-9085501H HCPL-560K 5962-9085501K	HCPL-6550 HCPL-6551 8102804 HCPL-665K 5962-9800104K	HCPL-6630 HCPL-6631 8102803 HCPL-663K 5962-9800103K
High Speed Logic Output, 10 Mbaud 3.3V		ACPL-2670L ACPL-2672L 5962-0824203H ACPL-268KL 5962-0824203K	ACPL-5630L ACPL-5631L 5962-0824202H ACPL-563KL 5962-0824202K	ACPL-5600L ACPL-5601L 5962-0824201H ACPL-560KL 5962-0824201K	ACPL-6650L ACPL-6651L 5942-0824204H2C ACPL-665KL 5942-0824204K2C	
High Speed Logic, Input Regulation, 10Mbaud		HCPL-1930 HCPL-1931 5962-8957201 HCPL-193K 5962-8957202K				
AC/DC to Logic Interface				HCPL-5760 HCPL-5761 5962-8947701 HCPL-576K 5962-8947702K		
Power MOSFET (relay replacement)				HSSR-7110 HSSR-7111 5962-9314001H HSSR-7112 5962-9314002H HSSR-711E 5962-9314001E		
Analog Isolation Amplifier				HCPL-7850 HCPL-7851 5962-9755701H ACPL-785E 5962-9755701E		
Intelligent Power Module and Gate Drive Interface				HCPL-5300 HCPL-5301 5962-9685201H HCPL-530K 5962-9685201K		
# of Channels	Dual (2)	Single (1)	Dual (2)	Single (1)	Quad (4)	Dual (2)
0.5 Amp Output Current IGBT Gate Drive				HCPL-5150 HCPL-5151 5962-0420501H		
2.0 Amp Output Current IGBT Gate Drive				HCPL-5120 HCPL-5121 5962-0420401H		
2.5 Amp Gate Drive		ACPL-5160 ACPL-5161				
Wide VCC from 4.5 to 20 Volts, High CMR, 5Mbaud			HCPL-5230 HCPL-5231 5962-8876901 HCPL-523K 5962-8876904K	HCPL-5200 HCPL-5201 5962-8876801 HCPL-520K 5962-8876802K	HCPL-6250 HCPL-6251 5962-8876903 HCPL-625K 5962-8876906K	HCPL-6230 HCPL-6231 5962-8876902 HCPL-623K 5962-8876905K
Very High Speed Logic, 20 Mbaud			HCPL-5430 HCPL-5431 5962-8957101 HCPL-543K 5962-8957103K	HCPL-5400 HCPL-5401 5962-8957001 HCPL-540K 5962-8957002K		HCPL-6430 HCPL-6431 5962-8957102 HCPL-643K 5962-8957104K

Commercial Product
MIL-PRF-38534 Class H Product
DLA SMD parts (H level)
MIL-PRF-38534 Class E Product
DLA SMD parts (E level)
MIL-PRF-38534 Class K Product
DLA SMD parts (K level)

*Devices also available with
2500 Vdc Withstand Test Voltage:
HCPL-5650, HCPL-5651, 8102805

Note:
DLA SMD (Standard Microcircuit Drawing) parts are dual-marked with both Broadcom part number and DLA SMD number